

Human Palaeontology and Prehistory / Paléontologie humaine et Préhistoire

The fauna and associated artefacts from the Lower Pleistocene site of Mansourah (Constantine, Algeria)

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Received 18 November 2005; accepted after revision 1 August 2006

Available online 14 September 2006

Presented by Philippe Taquet

Abstract

The site of Mansourah (Constantine, Algeria) had yielded to the early authors, and more recently to the late G. Laplace, a lithic industry associated with a fauna of large Mammals, which looks contemporaneous with that of Aïn Hanech, although it is well-distinct ecologically, and might even be slightly older. The lithic assemblage is completely devoid of any bifacial artefact or cleaver and can only be referred to the Oldowan. Thus, the Mansourah site documents a very early human occupation of North Africa, and perhaps one of the earliest. **To cite this article: Y. Chaid-Saoudi et al., C. R. Palevol 5 (2006).**

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Résumé

La faune du site Pléistocène inférieur de Mansourah (Constantine, Algérie) et l'industrie lithique associée. Le site de Mansourah (Constantine, Algérie) avait livré aux anciens auteurs, et plus récemment à G. Laplace, une industrie lithique associée à une faune de grands Mammifères, qui semble à peu près contemporaine de celle de l'Aïn Hanech, quoiqu'elle s'en distingue bien sur le plan écologique et par la présence de quelques taxons anciens, et pourrait donc même être un peu antérieure. L'industrie est totalement dépourvue de pièce bifaciale et de hachereau et ne peut être rattachée qu'à l'Oldowayen. Le site de Mansourah témoigne donc d'une très ancienne phase du peuplement humain de l'Afrique du Nord, peut-être même l'une des plus anciennes.

Pour citer cet article : Y. Chaid-Saoudi et al., C. R. Palevol 5 (2006).

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Keywords: North Africa; Algeria; Oldowan; Mammalian fauna; Lower Pleistocene; Early *Homo*

Mots clés : Afrique du Nord ; Algérie ; Oldowayen ; Faune de Mammifères ; Pléistocène inférieur ; Premiers *Homo*

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Version française abrégée

Introduction

Le plateau de Mansourah est situé au sud-est de la ville de Constantine. Il fait partie d'un ensemble de formations fluvio-lacustres fossilifères, reconnues dans le Constantinois au siècle dernier [25] et datées entre le Pliocène inférieur et le Pléistocène [6].

La première mention de vertébrés fossiles remonte à 1854 [3]. Certaines pièces furent figurées par Gervais [12], selon qui « tous les ossements [...] proviennent d'une couche d'argile tendre du Mansourah, placée au-dessous d'une assise de travertins. »

Thomas [25] mentionne encore quelques fossiles de Mansourah, provenant de son Pliocène supérieur de « faciès atlantique » (qu'il reconnaissait de la Tunisie à Alger) ; on peut penser qu'il s'agit des niveaux mentionnés par Gervais. Joleaud effectue des récoltes significatives, mais ne décrit brièvement qu'une antilope [15]. Il faut noter qu'aucun de ces auteurs ne s'est attaché à la stratigraphie détaillée.

C'est à G. Laplace, récemment disparu, que nous devons la première découverte d'industrie lithique sur le site de Mansourah [16,17]. Selon cet auteur, la stratigraphie se compose, de la base au sommet : (1) de travertins et sables jaunes, à polyèdres non roulés de quartzite et silex, et riches en faune ; (2) de galets emballés dans un limon rouge à blanc jaunâtre, à industrie plus diversifiée, mais roulée; (3) de limons rouges et graviers à industrie levalloiso-moustérienne, mais acheuléenne à la base. Notons donc que, selon Laplace, la séquence débute par les travertins, seuls fossilifères selon lui, et on peut donc en conclure que la totalité de ses récoltes de faune, conservées en Algérie, proviennent donc de ces derniers. Leur patine jaune-orangé se retrouve sur les pièces récoltées par Joleaud et conservées à Rabat, et même si quelques pièces ont pu être récoltées antérieurement, l'hypothèse d'une approximative contemporanéité de l'ensemble des collections fauniques de Mansourah nous semble actuellement la plus vraisemblable, même si elle devra être confirmée sur le terrain. Quoi qu'il en soit, la faune des travertins, à elle seule, permet de préciser l'âge de la collection lithique provenant des mêmes niveaux.

Industrie

À la suite de Laplace, Camps [4] récolte à Mansourah des pièces lithiques variées, mais sans en noter

la provenance stratigraphique. Elles ne sont certainement pas toutes contemporaines.

La collection Laplace regroupe des objets provenant des deux niveaux inférieurs (notés Mansourah) et de l'ensemble supérieur (notés L.R.) et fait donc foi de l'association stratigraphique de matériel taillé avec la faune. Le matériel des niveaux inférieurs comporte presque exclusivement des objets façonnés essentiellement en quartzite, de technologie simple, *choppers* unifaciaux et bifaciaux, voisinant avec des galets cassés, quelques éclats, des polyèdres irréguliers et des nucléus sur gros galets (Fig. 1). Les polyèdres sont de dimensions variées (80 à 180 mm de plus grand diamètre) et sont dans des états d'émoussé variés (frais à très roulé) ; les plus frais comportent des plages naturelles. De très rares pièces triédriques témoignent d'une chaîne de fabrication spécifique, mais, à l'exception d'une seule, dépourvue d'indication, toutes proviennent des niveaux supérieurs. La même superposition se retrouve d'ailleurs à l'Aïn Hanech [21]. Aucun objet du niveau le plus ancien ne peut être qualifié de pièce bifaciale à quelque stade d'élaboration que ce soit, ni de hachereau, et ne se rapporte donc à l'Acheuléen brièvement décrit et figuré par Camps [4 (pp. 25–28, figs. 11 & 13)]. La matière première (quartzite) de la presque totalité du matériel est certainement partiellement responsable de son aspect ancien, mais de très rares pièces en calcaire ne sont pas plus élaborées. L'industrie collectée in situ dans les travertins de Mansourah par G. Laplace appartient à une tradition technique *sans biface, ni hachereau*, échappant à la variabilité de l'Acheuléen régional et doit donc être rapportée à l'Oldowayen sensu lato.

Faune

La majeure partie de la faune figurée ou mentionnée par les auteurs antérieurs semble avoir disparu, et la plupart des pièces décrites ci-dessous n'ont jamais été mentionnées dans la littérature. Elles appartiennent aux collections du musée de la faculté des sciences de l'université d'Alger (FSUA), du musée national Cirta de Constantine (MNCC), et de la faculté des sciences de l'université de Rabat (FSUR).

Liste faunique

Cf. *Panthera pardus*: une diaphyse de tibia, de la taille de celui d'une panthère.

Elephas sp. : deux fragments de molaires peuvent être rapportés à une espèce évoluée de ce genre, peut-être *E. recki*.

Ceratotherium mauritanicum (Pomel, 1888) : une prémolaire inférieure a été figurée par Gervais [12 (pl. 19, fig. 2)].

Hipparion (s.l.) sp. : selon Thomas [25], le genre coexiste à Mansourah avec *Equus*, et même si aucune pièce ne subsiste en collection, sa détermination peut être retenue. Son extinction en Afrique du Nord est antérieure à l'âge de l'Aïn Hanech.

Equus cf. *tabeti* Arambourg, 1970 : les dimensions dentaires correspondent à celles de *E. numidicus* (Aïn Boucherit), d'un grand *E. tabeti* (Aïn Hanech), ou de *E. mauritanicus* (Tighenif), mais les restes sont trop incomplets pour une détermination spécifique.

Kolpochoerus cf. *maroccanus* (Ennouchi, 1953) : trois m³ possèdent trois paires de tubercules, plus un talon équivalant presque à une quatrième paire, chaque paire étant séparée de la suivante dans le plan médian par deux tubercules accolés (Fig. 2). Les vallées intermédiaires sont presque dépourvues de colonnettes accessoires. Les dents sont basses, mais l'une au moins porte des traces de ciment. Le *Kolpochoerus* de Mansourah semble distinct des lignées est et sud-africaines, ainsi que du *K. phacochoeroides* de l'Aïn Jourdel et de Ahl al Oughlam [9], qui ne possède qu'un tubercule médian entre les 2^e et 3^e paires de piliers, mais davantage de piliers accessoires. Les M3 de *K. maroccanus*, du Pléistocène inférieur marocain, sont grandes, mais simples ; des m3 qui pourraient être rattachées à cette même espèce sont connues à l'Aïn Hanech et à El Kherba [21,22], et c'est avec elles que les dents de Mansourah s'accordent le mieux.

Tragelaphus cf. *gaudryi* (Thomas, 1884) : quelques chevilles de cornes incomplètes appartiennent à un grand Tragelaphini. Elles sont plus proches de *T. gaudryi* de l'Aïn Jourdel que de *T. algericus* Geraads, 1981, de Tighenif. Toutes ces formes pourraient former une même lignée, bien distincte de celle d'Afrique orientale.

Bovini indet. cf. *Bos bubaloides* Arambourg, 1979 : un fragment de corne et un fragment de crâne appartiennent sans doute à l'une des espèces créées par Arambourg [2], mais on ne peut en tirer de conclusion biochronologique.

Oryx cf. *gazella* L. : deux cornes dépourvues de compression transversale doivent donc être rattachées aux oryx de type moderne, qui apparaît au niveau de l'Aïn Hanech.

Kobus aff. *kob* Erxleben, 1777 : l'antilope la plus commune est un cobe voisin de la forme actuelle et pléistocène *K. kob*, qui est très polymorphe. Les cornes courtes et trapues semblent néanmoins indiquer une variété distincte.

Alcelaphini indet. Un fragment de molaire supérieure.

Gazella cf. *pomeli* Arambourg, 1979 : deux cornes peuvent être rattachées à cette espèce, définie à l'Aïn Hanech.

Hippopotamus cf. *sirensis* Pomel, 1896 : un grand hippopotame tétraprotodonte, voisin de l'espèce actuelle, est commun. Il faut sans doute lui rattacher une symphyse mandibulaire décrite par Pomel comme provenant d'un autre site, sous le nom de *H. hipponensis*.

Écologie

Bien qu'elle soit biaisée en faveur des grands mammifères, quelques indications peuvent être tirées de la faune de Mansourah. Les témoins de milieux ouverts et secs y sont plus rares que dans la plupart des autres sites nord-africains de cette période, tandis que Tragelaphini et Reduncini parlent en faveur d'une végétation mixte humide de buissons et prairie.

Biochronologie

Plusieurs espèces de Mansourah sont également connues à l'Aïn Hanech. Tels sont *Equus* cf. *tabeti*, *Gazella* cf. *pomeli* et *Kolpochoerus* cf. *maroccanus*. Dans l'ensemble, un âge voisin de celui de l'Aïn Hanech nous semble pouvoir être retenu, mais la présence possible d'*Hipparion*, ainsi que du *Tragelaphus* cf. *gaudryi*, intermédiaire entre celui du Pliocène supérieur et le *T. algericus* de Tighenif, et d'un *Kobus* probablement distinct de *Kobus kob* tend à vieillir le site.

Conclusion

Nous avons déjà eu l'occasion de discuter l'ancienneté de la présence humaine au Maghreb, que ce soit au Maroc [19,20] ou en Algérie [5,11]. Dans cette région, il est apparu clairement que les données biostratigraphiques étaient à ce jour essentielles pour estimer la position chronologique relative des différents gisements. La richesse et l'originalité de la grande faune des travertins de Mansourah situent clairement leur mise en place au cours du Pléistocène inférieur.

La présence d'une industrie lithique, associée rapportable à l'Oldowayen *sensu lato*, fait de ce site un jalon essentiel pour la connaissance des premiers peuplements d'Afrique du Nord, dont il convient à présent de confirmer le détail stratigraphique et archéologique par des fouilles modernes.

1. Introduction

The plateau of Mansourah is located southeast of the city of Constantine, Algeria. Its coordinates are: $x = 852$, $y = 347$ (sheet El Aria N° 74, scale 1:50 000, 1906–1908, and 1977). It belongs to a series of fluvio-lacustrine formations, including fossiliferous localities such as Aïn el Bey, Aïn Jourdel and Aïn el Hadj Baba, first surveyed in the 19th century by P. Thomas [25] and dated from the Lower Pliocene to the Pleistocene [6].

Bayle [3] was the first to report fossil vertebrates, including hippos, equids, and antelopes, some of which were illustrated by Gervais [12]; according to him, all bones come from a soft clay layer, underlying the travertines.

Thomas [25] described some more fossils from Mansourah. According to him, the Upper Pliocene of 'Atlantic facies', widespread from Tunisia to Algiers, is illustrated there by conglomerates and red sands equivalent to the Aïn Jourdel sands. Later, Joleaud collected a significant amount of material, now kept in FSUR and FSUA, but described only an antelope [15]. None of these early authors paid much attention to the detailed local stratigraphy.

We owe to the late G. Laplace the first discovery of lithic industries in Mansourah, and the first short report on the stratigraphy [16,17]. He collected there several hundreds of artefacts, now housed in the 'Musée national de Préhistoire', Les Eyzies, France. According to him, the stratigraphy includes, from bottom to top: (1) travertines and yellow sands, rich in fauna, with fresh polyhedrons in quartzite or flint; (2) pebbles in a silty red or yellowish matrix, with more diverse, but weathered, industry; (3) red silts and gravels with Levalloiso-Mousterian industry, but Acheulean at the base. He made no mention of fauna in the upper two layers, and no mention of any layer underlying the travertines; therefore, his whole faunal collection, kept in Algeria, comes from the travertines. Their yellow colour is similar to that of the fossils collected by Joleaud in FSUR, and they probably have the same origin. Some other reddish fossils might come from either the underlying or overlying levels. We believe that the whole faunal collection is roughly of the same age

but, in any case, the fauna from the travertines itself provides a biochronological dating for the associated industry.

2. Lithic industry

Following Laplace, Camps [4] collected various artefacts in Mansourah, but without recording their stratigraphic provenance. They are nevertheless certainly not all contemporaneous.

The bulk of the Laplace collection consists of artefacts from the lower units (noted Mansourah) and from the upper units (noted L.R.). Artefacts from the lower units were clearly associated with the fauna. The assemblage of the lower units is almost exclusively manufactured in quartzite, with simple technological procedures and consists of choppers, broken pebbles, a few flakes, irregular polyhedrons and nucleus on large pebbles (Fig. 1). Polyhedrons vary in size (80 to 180 mm wide) and are in different state of weathering (from fresh to heavily eroded), the fresh ones have natural surfaces preserved. A few trihedral artefacts are present but, besides one artefact bearing no indication of its origin, they all come from the upper units. The same succession was already found at Aïn Hanech [21]. No hand axe or cleaver exists in the lower units collection and the assemblage is therefore unlike the Acheulean briefly described and illustrated by Camps [4 (pp. 25–28, figs. 11 & 13)]. The nature of the raw material, quartzite, is certainly partly responsible for the very crude look of most artefacts, but the few limestone artefacts are similarly crude. The industry collected in situ by G. Laplace in the Mansourah travertines must be attributed to a technical tradition that is clearly not Acheulean and probably belongs to the Oldowan tradition.

3. Fauna

Part of the described fauna, in particular that illustrated by Gervais [12], is apparently lost, but most of the specimens described below had never been reported. They belong to the collections of the 'Faculté des sciences d'Alger' (FSUA), of the 'Musée national de Constantine' (MNCC), and of the 'Faculté des sciences de l'université de Rabat' (FSUR).

3.1. Faunal list

Cf. *Panthera pardus*. A single tibial diaphysis matches that of a panther.

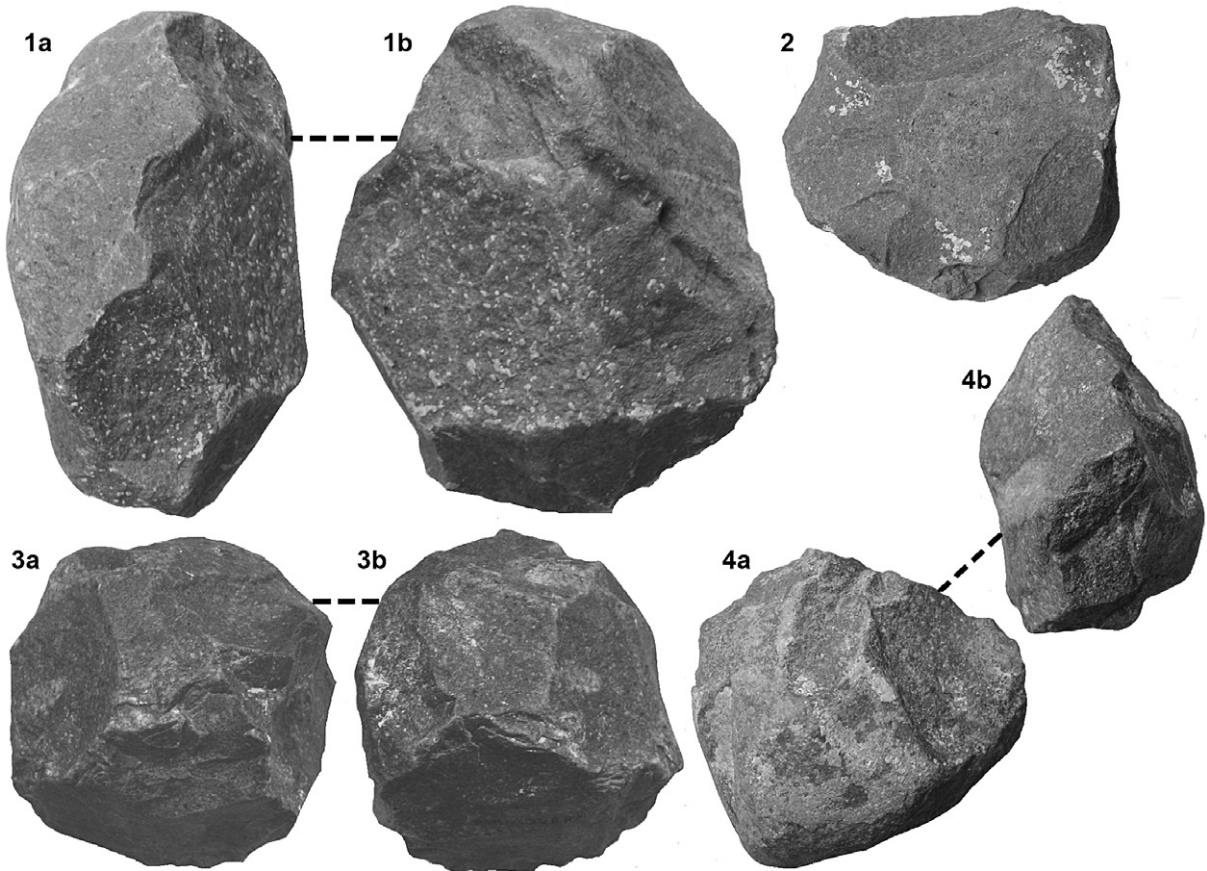


Fig. 1. Some artefacts from Mansourah: 1, bifacial chopper; 2, unifacial chopper; 3, polyhedron; 4, bifacial chopper. 'Musée national de Préhistoire', Les Eyzies, France. All figures: 50%.

Fig. 1. Quelques artefacts de Mansourah : 1, *chopper* bifacial ; 2, *chopper* unifacial ; 3, polyèdre ; 4, *chopper* biface. Musée national de Préhistoire, Les Eyzies. Toutes les figures : 50%.

Elephas sp. Gervais illustrated a molar fragment with two plates [12 (pl. 19, fig. 1)]. A distal fragment in FSUR has three plates, a width of 63 mm, and a height of 114 mm. Both are not of *Loxodonta* (the common form at Tighenif), and they must belong to some derived form of *Elephas*. Arambourg [1] gave the name *E. moghrebiensis* to the Aïn Hanech elephant, and reported it also from Mansourah, but it might be identical to the East African *E. recki*.

Ceratotherium mauritanicum (Pomel, 1888). Gervais [12 (pl. 19, fig. 2)] had figured a left lower p3, now lost. It is definitely less derived than that of *C. simum* and it must belong to *C. mauritanicum*, an extinct species defined at Tighenif, but which survived late in the Maghreb [10].

Hipparion sp. Thomas [25] stated that *Hipparion* teeth occur at Mansourah, together with *Equus*, but did not provide any description or figure, and no speci-

men is presently available. However, given their hardly mistakable morphology, this occurrence must be taken as very likely. In East Africa, *Hipparion* s.l. became extinct in the early Middle Pleistocene; its LAD in North Africa is more imprecise, but probably earlier. It is present at Aïn Boucherit, close to the Plio-Pleistocene boundary, but the two teeth found at Aïn Hanech are probably reworked from the lower level [1]; *Hipparion* was not found in the recent excavations at the latter site [21]. Thus, if its occurrence in the lower layer of Mansourah is taken for granted, it points to an age earlier than that of Aïn Hanech.

Equus cf. *tabeti* Arambourg, 1970. Several teeth (mainly upper) and incomplete limb-bones in Algiers belong to at least one species of *Equus* whose size would fit *E. numidicus*, a large form of *E. tabeti*, or *E. mauritanicus*, three North African forms best known from Aïn Boucherit, Aïn Hanech and Tighenif,

respectively [1,11,23]. The outline of the external wall is more like asinine horses, and the long protocone is unlike that of *E. numidicus*, but isolated teeth of *Equus* are hardly identifiable to species.

Kolpochoerus cf. *maroccanus* (Ennouchi, 1953). The material consists of three m3s (basal length = 57.1, 57.0, 57.2; width = 20.8, 22.2, 22.2, respectively) and a talus, in Constantine. The last two m3s are unworn (height = 21.8, 21.9), and almost certainly from the same individual (Fig. 2); the third tooth is slightly worn, and very similar. There are three pairs of rather widely spaced pillars, plus a strong ‘talonid’, almost as wide as the preceding pair, and consisting of two closely appressed sub-equal pillars. There are two small accessory pillars between the talonid and the third pair, on the lingual side, and a small poorly distinct pillar between the first two pairs, on the labial side; all other valleys are free of accessory pillars. Along

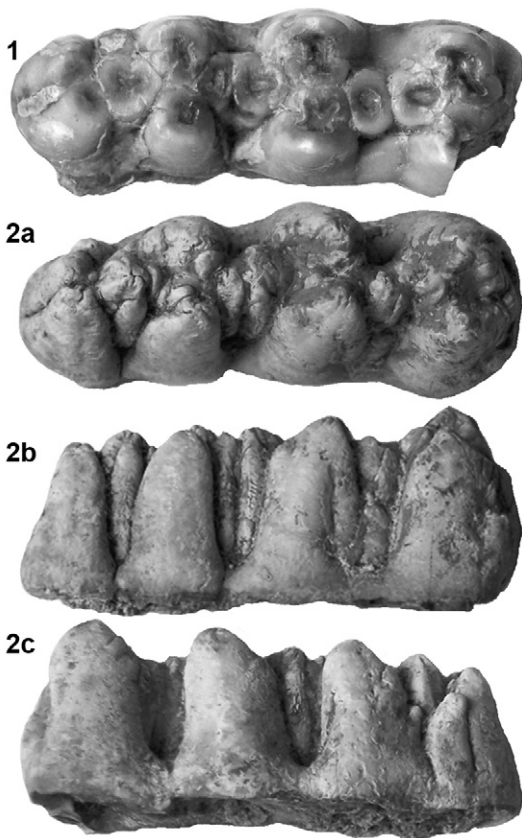


Fig. 2. *Kolpochoerus* cf. *maroccanus*, Mansourah, lower m3s, FSUA: 1, right m3 7185001, occlusal view; 2, left m3 718002 in (a) occlusal, (b) labial and (c) lingual views. 100%.

Fig. 2. *Kolpochoerus* cf. *maroccanus*, Mansourah, m3 inférieures, FSUA : 1, m3 droite 7185001, vue occlusale ; 2, m3 gauche 7185002 en vues occlusale (a), labiale (b) et linguale (c). 100%.

the midline of the teeth, the successive pairs of pillars are separated by two median pillars. They are sub-equal in size between pairs 1–2, but the anterior one is larger between pairs 2–3. Between the third pair and the talonid, the posterior one is larger and quickly fuses with the anterior one. The teeth are brachyodont, the unworn teeth being very slightly broader than high. Some cement coating remains on the worn tooth only, but the other teeth lack roots and were unerupted, so that cement might not have deposited yet.

Kolpochoerus is one of the most common suids in the Plio-Pleistocene of Africa, but the Mansourah molars differ from all eastern and southern forms. The m3s are definitely shorter than those of *K. paiceae* from South Africa or the latest forms of *K. heseloni* from Koobi Fora, longer than those of *K. afarensis* from the Pliocene of Ethiopia, or than the early forms of *K. heseloni* from the Turkana basin, and longer and relatively narrower than those of *K. majus* from the Pleistocene of East Africa. Furthermore, the m3s of *K. paiceae* always have more than three pairs of pillars, and all posterior tubercles have a simple morphology. On the contrary, *K. afarensis* and early forms of *K. heseloni* have more simple m3s. The size of the teeth from Mansourah is within the variation range of *K. heseloni* from the Omo member G or the Koobi Fora Upper Burgi and KBS members (Fig. 3). However, m3s of comparable size in the Turkana basin are more complex and more hypsodont than those from Mansourah, while those of similar complexity are smaller (see [13 (pl. 6.12.H and pl. 6.12.D)] as examples of the former and the latter, respectively). Specimens from the Lower Pleistocene of Konso, Ethiopia, of similar size, are also more complex than those from Mansourah, with a talonid consisting of at least three pillars ([24], figs. 3A, D). Thus, although the m3 pattern is similar, the Mansourah *Kolpochoerus* is not on the evolutionary lineage of *K. heseloni*.

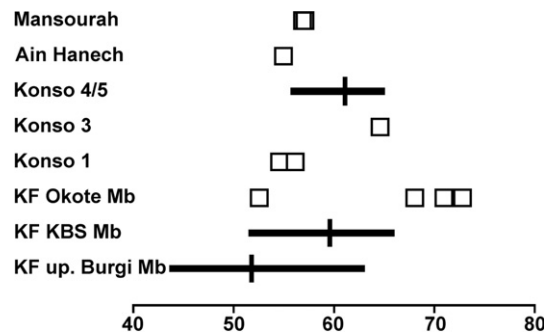


Fig. 3. Lengths of *Kolpochoerus* lower m3s from various sites. Fig. 3. Longueurs des m3 de *Kolpochoerus* de quelques sites.

Kolpochoerus has a sparse record in North Africa. Thomas [25] first recorded *K. phacochoeroides* from the Late Pliocene of Aïn el Bey, Algeria. This species is best known from the Late Pliocene of Ahl al Oughlam in Morocco [8,9], which yielded hundreds of specimens. Among these are about 25 m3s; they are more hypsodont than at Mansourah, there is a single median pillar between the 2nd and 3rd pairs of pillars, the successive pairs are less clearly separated, with the valleys often blocked by extra pillars, and the talonid consists of several small pillars. Thus, the Mansourah *Kolpochoerus* is clearly distinct from *K. phacochoeroides*.

K. maroccanus (Ennouchi, 1953) is the only other named North African form. The type, kept in FSUR, consists of an incomplete M3, plus P3–P4 probably from the same individual, of unknown geological age. The size of M3 matches the largest teeth of *K. phacochoeroides*, but the tooth is as simple as the smallest teeth of this species, and is slightly less hypsodont. Another M3 from level L of Thomas quarry [11], of Early Pleistocene age, has a slightly broader talon but is otherwise similar. We believe that *K. maroccanus* is a species different from *K. phacochoeroides*, but the shared disto-lingual fovea on P4 suggest that they belong to the same clade. Thus, *K. maroccanus* is an enlarged version of the smaller morph of *K. phacochoeroides*, somewhat like *K. majus* is an enlarged version of a simple morph of *K. heseloni* in East Africa. The m3s from Mansourah look very much like what could be expected of the m3s of *K. maroccanus*: a rather large size with a relatively simple morphology. The same species is very probably present at Aïn Hanech and El Kherba, where incomplete m3s were reported [21,22], but *Kolpochoerus* is unknown in later sites (Tighenif, and the Middle Pleistocene).

Tragelaphus cf. *gaudryi* (Thomas, 1884). A frontlet of a kudu-like antelope from Mansourah, first mentioned by Bayle [3], was figured by Gervais [12 (pl. 19, fig. 4)], but is now probably lost. No scale was given by Gervais, and the only point of his description not visible on the figure is that there is only one keel on the horn-core. This keel is anterior, and conspicuous, but the outline of the horn-core suggests that it was not very prominent, and that the cross-section was more or less rounded. This frontlet was referred by Gentry [7] to *Tragelaphus gaudryi* (Thomas, 1884), the type horn-core of which, from Aïn Jourdel, has a clear but not very prominent anterior keel, and an almost round cross section (about 50 × 50 mm). Two more *Tragelaphus* horn-cores are

preserved in the FSUR, and two in Constantine (Measurements: APD × TD: FSUR: 66 × 55 and 65 × 67; MNCC: 56 × 56.5 and 66 × 58.5). They were much inclined caudally and rather divergent. The only keel is the anterior one, which is faint to moderate. They are similar to the type of *T. gaudryi*, but their larger size and weak anterior keel make this animal resemble *T. algericus* Geraads, 1981, from Tighenif, which is probably its descendant. However, the single horn-core from Tighenif is still larger (basal index: 82 × 75), more tightly spiralled, and has an incipient postero-medial keel, of which there is only a hint at Mansourah. Thus, in North Africa, the evolution from primitive *T. gaudryi* was clearly divergent from the East African one, where it is marked by an increase in transverse compression and strengthening of the anterior keel [7].

Cf. ‘*Bos*’ *bubaloides* Arambourg, 1979. Thomas ([25], pl. 4, fig. 6) referred a horn-core tip to ‘*Bubalus antiquus*’, but this species is of much later age. Arambourg [2] described three species in the Lower Pleistocene of North Africa: *Bos bubaloides* and *B. praeafricanus* from Aïn Hanech are one and the same species, doubtfully distinct from *B. palaethiopicus* from Aïn Boucherit. As the horn-core is too dorso-ventrally compressed to belong to *Bos* s.l., the Mansourah bovine is certainly one of these; a similar horn-core tip has been found in the Late Pliocene of Ahl al Oughlam. A cranial fragment with the base of the horn-core in Constantine comes probably from the same species, but it is not clear yet whether it belongs to the African or Eurasian group.

Oryx cf. *gazella* L. A horn-core from Mansourah, now in the FSUR, was figured [15 (pl. 1, fig. 1)] as *Oryx leucoryx*, and as more slender than it really is. The diameters of its lowermost part, several centimetres above the missing base, are 42.5 × 36.8. Another horn-core, in Constantine, is preserved down to the base, which is almost round in cross-section (index: 48.5 × 49), but the transverse compression increases upwards, suggesting that the basal cross-section of the FSUR specimen was probably also almost circular. They are slightly curved (FSUR) or almost straight (MNCC). By their lack of transverse compression at the base (a feature probably linked with greater inclination backwards), they differ from oryx horn-cores from Late Pliocene or Early Pleistocene sites in the Turkana basin, but are similar to the modern type, known from Aïn Hanech onwards.

Kobus aff. *kob* Erxleben, 1777. The most common antelope at Mansourah is close to the modern *K. kob*. A

horn-core was figured [12 (pl. 19, fig. 5)], and there are several specimens in Rabat and Algiers. Fossil and modern forms of *K. kob* display a large range of variations in size and morphology that encompass those of the Mansourah form, except that horn-cores of the latter are quite short, as in the allied genus *Redunca*. The transverse compression and backward curvature are unlike the latter genus, and they certainly belong either to an extinct sub-species of *K. kob* or to a new species.

Alcelaphini indet. A single fragment of upper molar is definitely alcelaphine.

Gazella cf. *pomeli* Arambourg, 1979. Two incomplete horn-cores, rather short, slightly curved and little compressed, match those of this species, best known from Aïn Hanech.

Hippopotamus cf. *sirensis* Pomel, 1896. The size and morphology of the hippo, common in FSUA and FSUR, are those of the living *H. amphibius* or of the Pleistocene *H. sirensis* (= *H. gorgops*?). Mention must be made of an anterior fragment of mandible, described and illustrated [18 (pl. 4, Figs. 1–3)] as coming from the ‘route des Beni Foudda’, but which is labelled ‘Mansourah’; its light yellow colour better fits the latter site. As already shown by Arambourg, it clearly does not belong to *H. hipponensis*, a hexaprotodont species.

3.2. Ecology

Although the sample is limited and certainly biased towards large animals, some conclusions can be drawn from the faunal assemblage. Hippos are common in all open-air Plio-Pleistocene African assemblages, but tell us nothing about the environment away from the lake or river margin. Alcelaphines, indicators of open dry environments, are rare at Mansourah, in contrast to most Plio-Pleistocene North-African sites. The best only indicators of open dry country are the *Oryx* and *Gazella* horn-cores. Tragelaphini and Reduncini form the bulk of the Mansourah bovid fauna, as in many East African sites, but they are not common components of North-African Plio-Pleistocene faunas. Modern species of the former tribe feed on leaves and are therefore indicators of small trees or bushes, while the latter tribe inhabits wet grasslands. *Kolpochoerus* co-occurs in large numbers with these tribes in the Turkana basin, and was found to be mostly a grazer [14], but more water-dependent than *Metridiochoerus*. Hence, the most consistent picture for Mansourah is that of mixed wet grassland and bushland.

3.3. Biochronology

Among the fauna from the travertines, some taxa have poor biochronological significance. Large tetraprotodont hippos are known from the Late Pliocene onwards; the elephant and Bovini are too poorly known to be useful; *Ceratotherium mauritanicum* survives late in North Africa. *Oryx* cf. *gazella* is probably the only living species, but it is present as early as Aïn Hanech. *Kobus kob* is known from the Late Pliocene onwards, but the features of the Mansourah horn-cores suggest an extinct variety or species. *Hipparion* would definitely point to an earliest Pleistocene age, but a doubt remains as to its occurrence in the travertines. Some taxa have more specific affinities with those from Aïn Hanech. Such is *Equus* cf. *tabeti*, also known from Ubeidiyeh in Israel, roughly of the same age, *Gazella* cf. *pomeli*, and *Kolpochoerus* cf. *maroccanus*. Perhaps the most interesting taxon is *Tragelaphus* cf. *gaudryi*, intermediate between the Late Pliocene type of this species, and the *Tragelaphus algericus* from the late Early/early Middle Pleistocene of Tighenif. On the whole, the fauna best matches that of Aïn Hanech, but the latter site has neither Tragelaphini nor Reduncini, and therefore lacks these evidences of early age that are present at Mansourah. The features of the lithic industry are in accordance with an Early Pleistocene age.

4. Conclusion

We have already discussed the age of the first human arrival in Maghreb, either in Morocco [19,20] or in Algeria [5,11]. In this area, biostratigraphic data are essential to assess the relative chronology of the different sites. The rich and diverse fauna of large mammals from the Mansourah travertines clearly indicates an Early Pleistocene age and is associated with lithic industry of Oldowan technology. This site is therefore a major milestone for the North African Early Palaeolithic. However, further fieldwork and excavations are needed to precise its stratigraphy and archaeological succession.

Acknowledgements

D.G. wishes to thank C. Cabon, J.-J. Cleyet-Merle, and A. Morala, for allowing him to study the collections of the late Georges Laplace. We are also grateful to M. Aberkan (Department of Geology, University of Rabat), Prof. F. Chikhi-Aouimeur (Geological Museum

of Algiers University), the Algerian Ministry of Culture, D. Kettani (National Museum Cirta of Constantine), and S. Abdesslam.

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